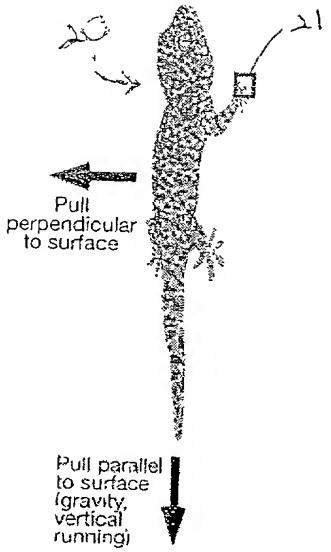

Fig. 1A

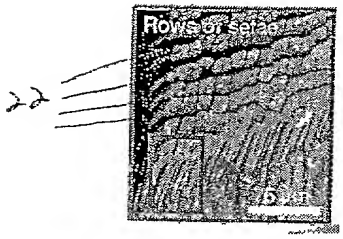

Fig. 1B

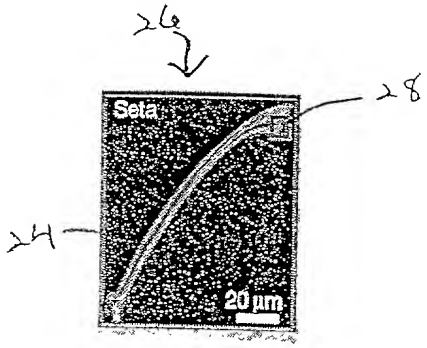

Fig. 1C

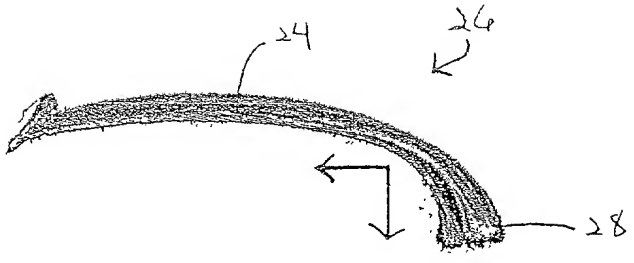

Fig. 1D

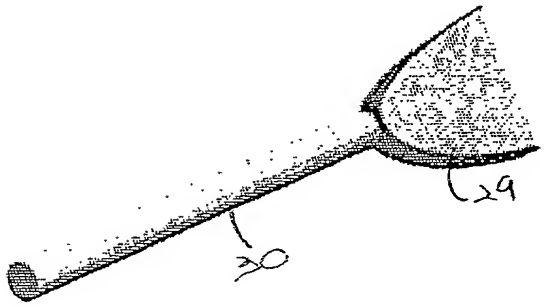

Fig. 1E

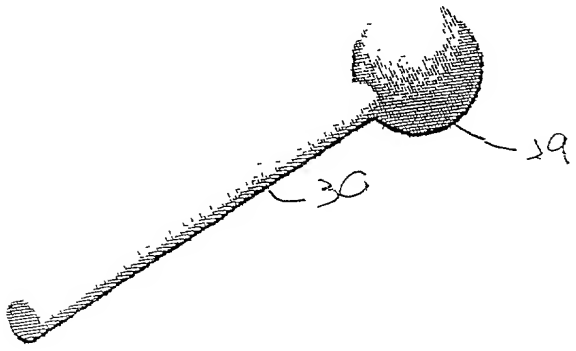

Fig. 1F

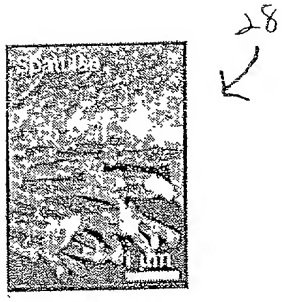

Fig. 1G

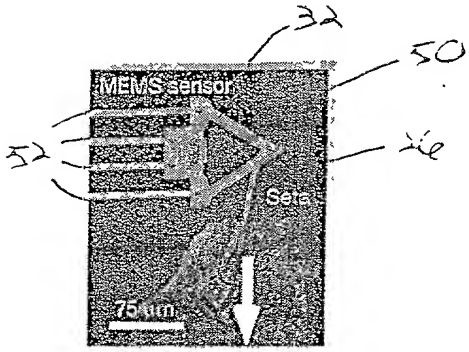

Fig. 1H

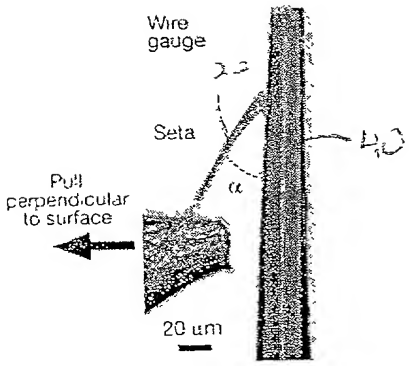

Fig. I

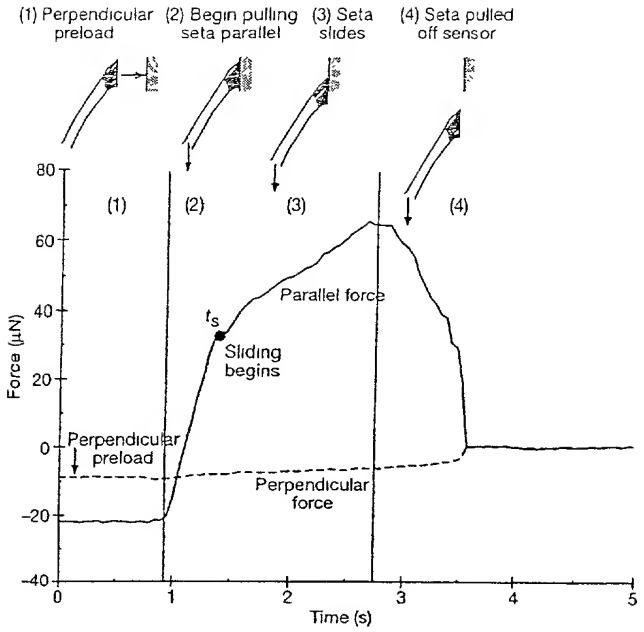
(1) Perpendicular preload
(2) Begin pulling seta parallel
(3) Seta slides
(4) Seta pulled off sensor
(1)
(2)
(3)
(4)
Parallel force
t_s
Sliding begins
Perpendicular preload
Perpendicular force
Force (μN)
Time (s)

Fig. 2A

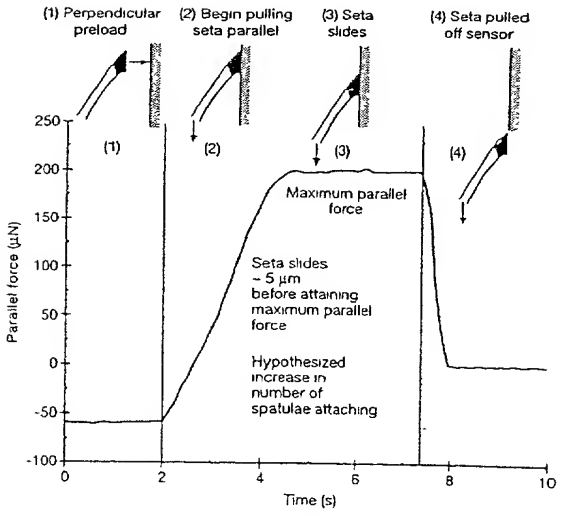
(1) Perpendicular preload
(2) Begin pulling seta parallel
(3) Seta slides
(4) Seta pulled off sensor
Maximum parallel force
Seta slides ~ 5 μm before attaining maximum parallel force
Hypothesized increase in number of spatulae attaching
Parallel force (μN)
Time (s)

Fig. 2B

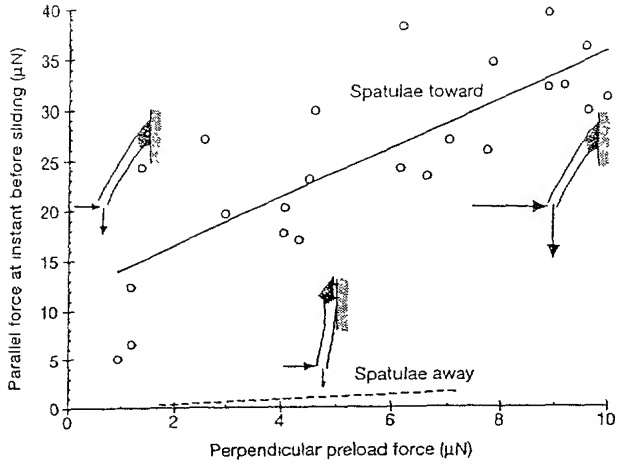
Parallel force at instant before sliding (μN)
Perpendicular preload force (μN)
Spatulae toward
Spatulae away
0
5
10
15
20
25
30
35
40
0
2
4
6
8
10

Fig. 3

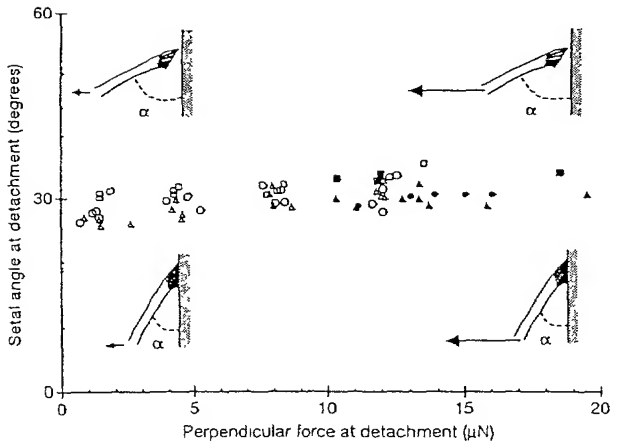
Setal angle at detachment (degrees)
Perpendicular force at detachment (μN)
α
0
30
60
0
5
10
15
20

Fig. 4

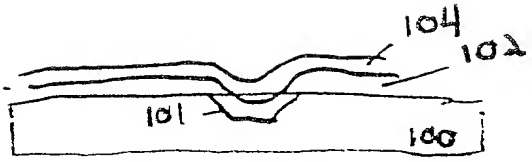

Fig. 5A

Fig. 5B

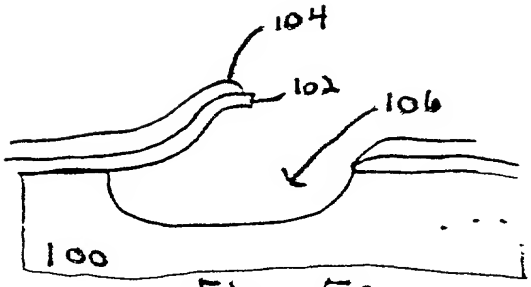

Fig. 5C

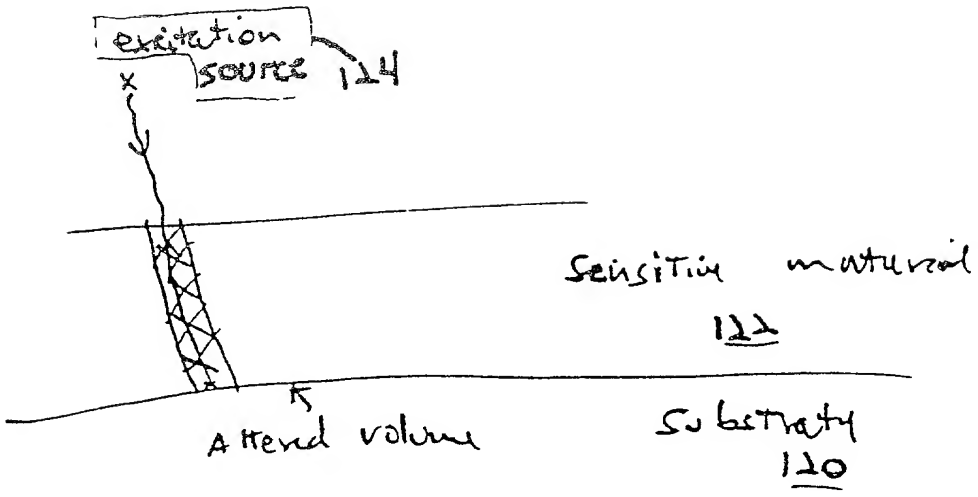
excitation source 124
Sensitive material 122
Attend volume
Substrate 120

Fig 6A

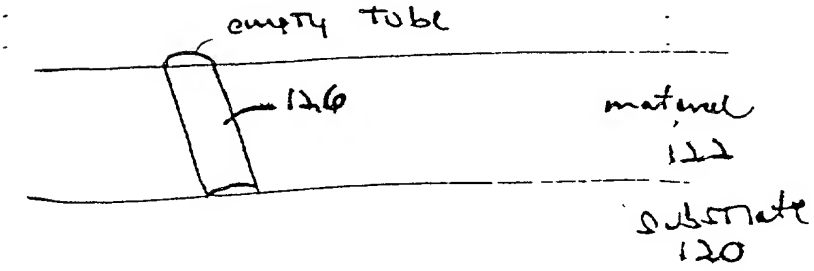
empty tube
126
material 122
substrate 120

Fig. 6B

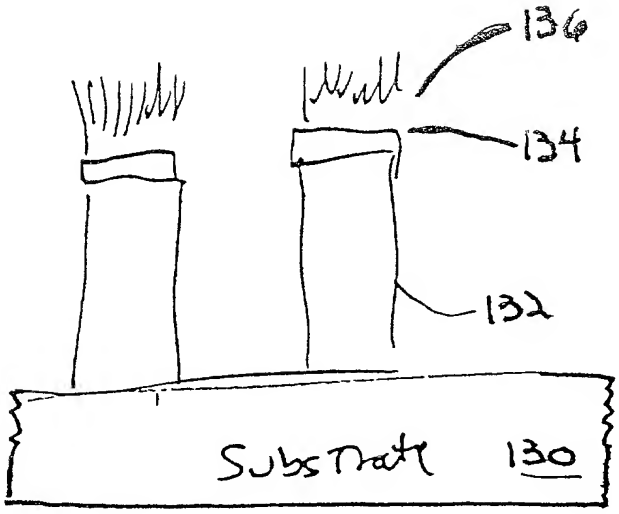

Fig. 7

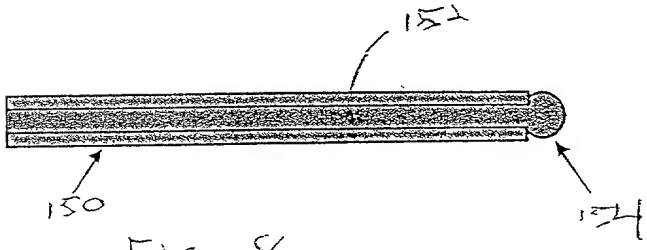

Fig. 8

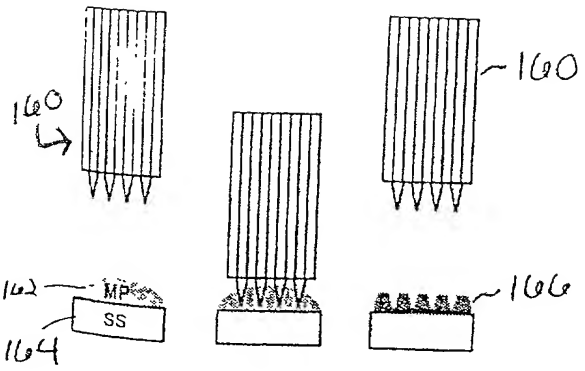

Fig. 9

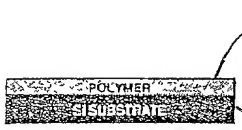

Fig. 10A

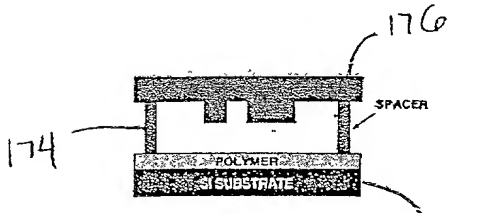

Fig. 10B

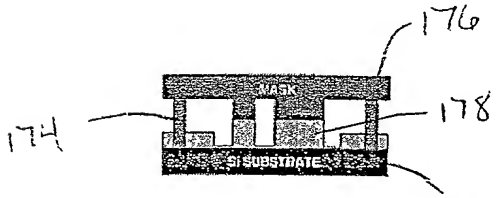

Fig. 10C

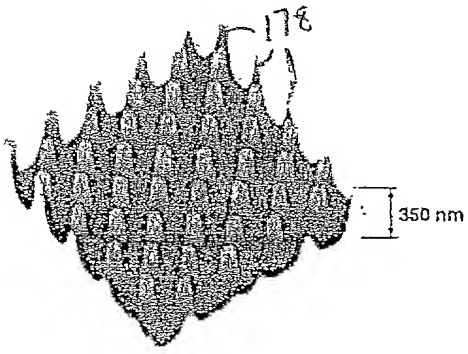

Fig. 10D

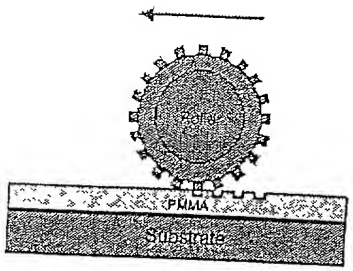

Fig. 11A

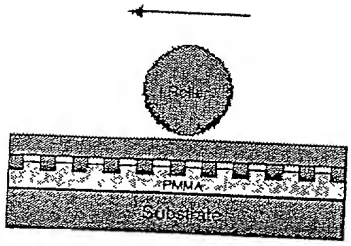

Fig. 11B

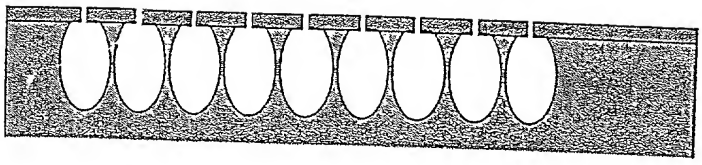

Fig. 12

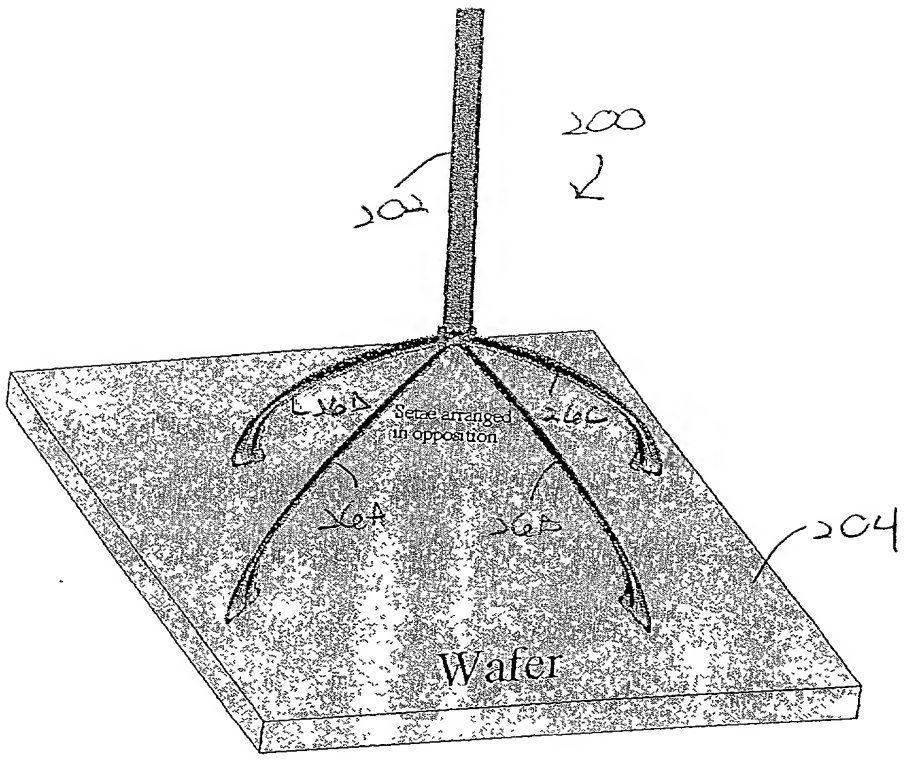

Fig. 13

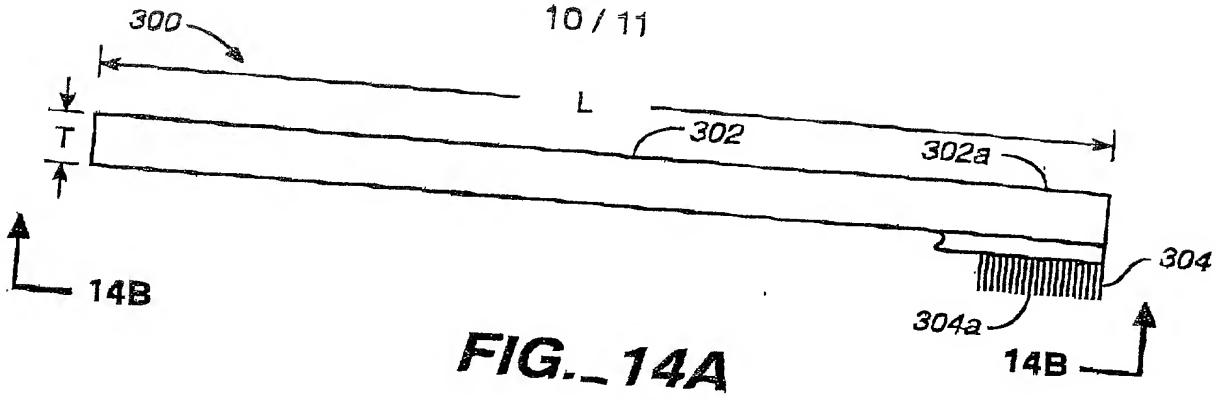

FIG._14A

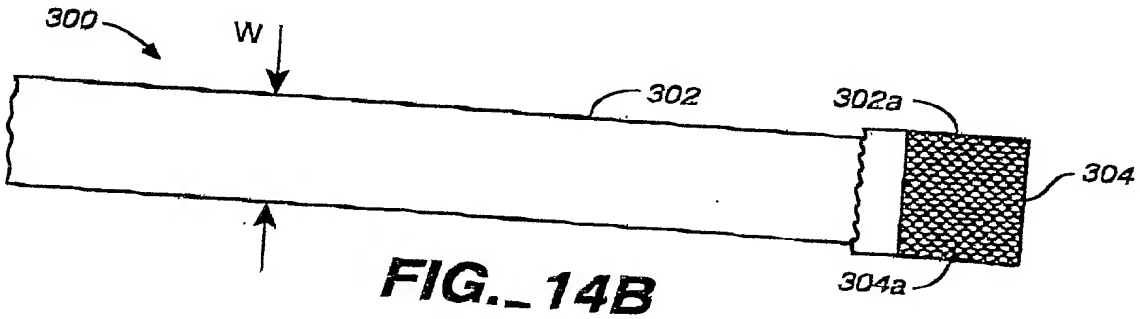

FIG._14B

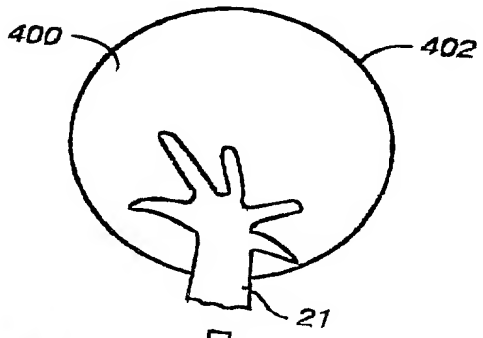

FIG._15A

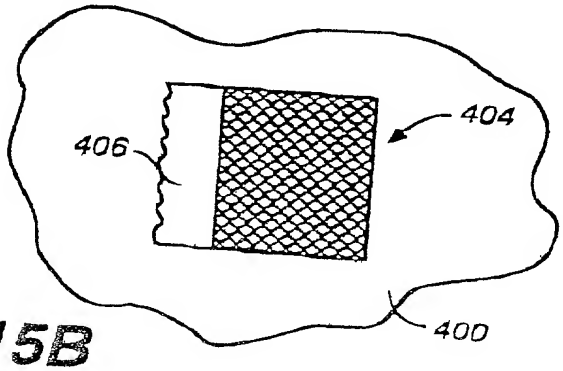

FIG._15B

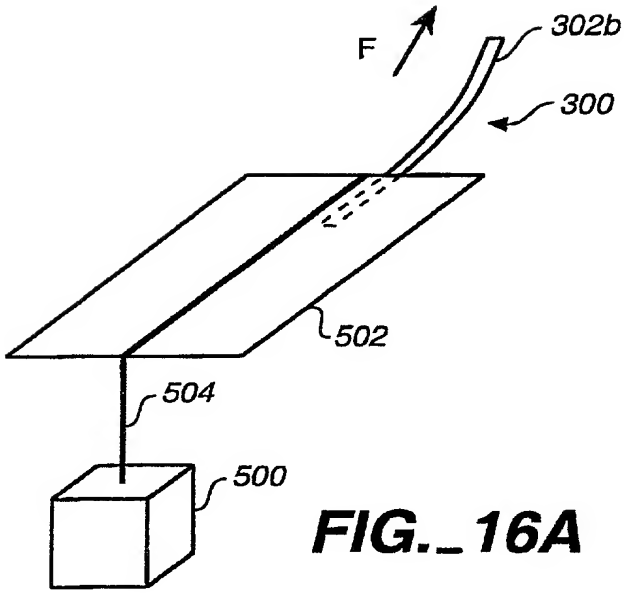

FIG._16A

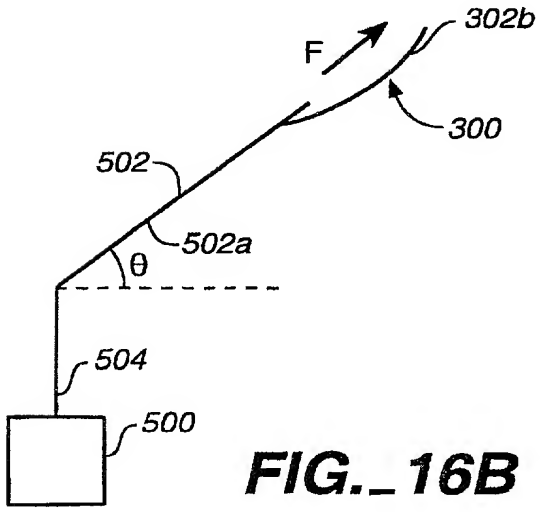

FIG._16B

Static Force Builds

Array is Preloaded

Array slides- kinetic friction

Pull ends, force decreases as array is separated from the force plate

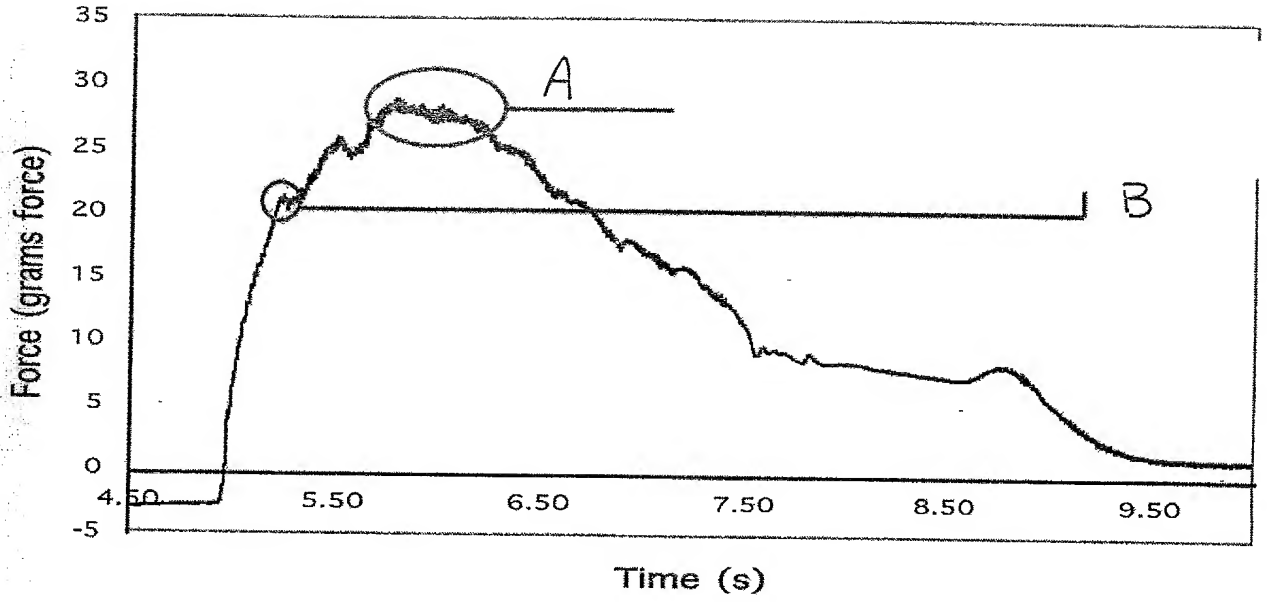

FIG. 17

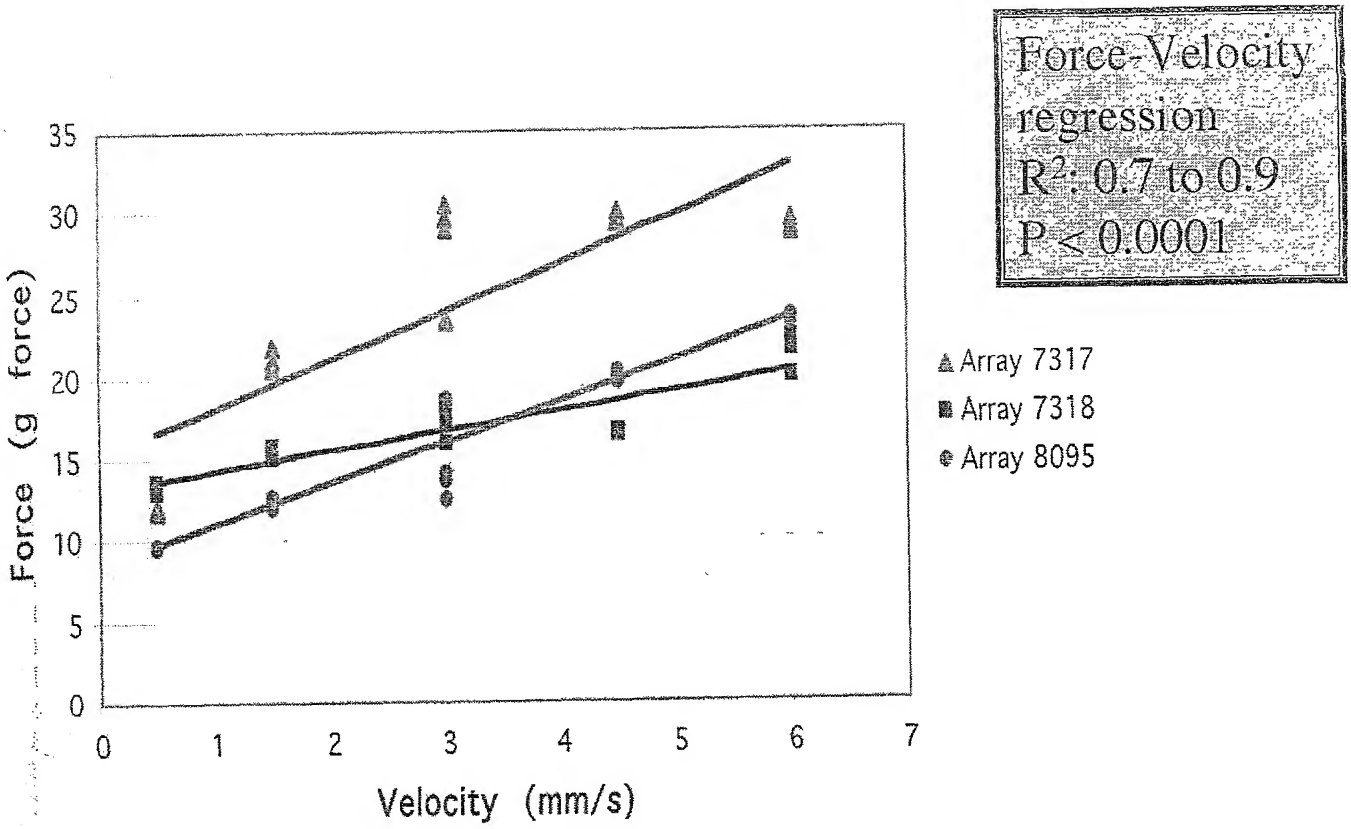
Force-Velocity regression
R²: 0.7 to 0.9
P < 0.0001
Force (g force)
Velocity (mm/s)
0
5
10
15
20
25
30
35
0
1
2
3
4
5
6
7
Array 7317
Array 7318
Array 8095

FIG. 18